

## NARRATIVE PROGRESS REPORT

Date prepared: 3/10/2009

### PROJECT INFORMATION:

Project Title: Transportation Impact on the Economy	
Problem Statement No. N/A	NJDOT Task Order No. N/A
Study Start Date: 1/1/2008 Study End Date: 6/30/2009	Reporting Period: 10/1/2008 – 2/28/2009
NJDOT Project Manager: Ed Kondrath	Principal Investigator: Joseph J. Seneca

### PERCENT OF WORK COMPLETED:

Activity	% of Task Complete
Task 1 – Conduct comprehensive literature review and current practice scan	100%
Task 2 – Estimate the aggregate impact of highway investment on the NJ economy	80%
Task 3 – Estimate the direct and indirect impacts of transportation infrastructure expenditures on the economy	80%
Task 4 – Estimate the effects of cost reduction due to transportation investments	75%
Task 5 – Synthesize data results, identify policy implications and formulate recommendations	50%
Task 6 – Prepare quarterly progress reports, draft and final reports	30%
Task 7 – Disseminate research results and conduct agency/legislative briefings	0%

**NJDOT Concurrence:** \_\_\_\_\_  
Name Title Date

## PROGRESS BY TASK FOR THIS REPORTING PERIOD

The following activities were undertaken by the project team during this reporting period:

### Task 1 – Conduct general literature and best practices scan

- Dr. Ozbay's team has completed draft literature reviews on the impacts of highway capital investments on employment and regional economy and highway transportation cost categories.

### Task 2 – Estimate the aggregate impact of highway investment on the NJ economy (Dept. of Transportation Engineering: Dr. Kaan Ozbay, Dr. Bekir Bartin, et al.)

Dr. Ozbay's team conducted an analysis of the economic impacts of five selected real-world highway capacity investments. Five major roadway widening projects that were completed between 2004 and 2009 in Northern NJ were selected for the analysis. Table 1 summarizes the details of the selected projects.

**Table 1. The selected widening projects in northern New Jersey**

Route	Location	Length	Work Type	Cost
Route 17	Bergen County	0.50 miles	Roadway Widening & Bridge Reconstruction	\$84.4 million
Route 18	Middlesex County	1.54 miles	Roadway Widening & Extension	\$82 million
Route 35	Middlesex Country	1.38 miles	Roadway Widening & Bridge Reconstruction	\$129.6 million
Route 1&9	Union County	n/a	Bridge Reconstruction	\$72 million
Route 1	Middlesex County	2.92 miles	Roadway Widening & Bridge Reconstruction	\$59 million

For each selected past highway capital improvement project, the capacity improvement is incorporated into the NJRTM CUBE model by increasing the capacity of the link where the project took place.

The NJRTM network is run with and without capacity improvements, and the network traffic flows are obtained from CUBE. Using the before and after network results, the benefits are estimated through reduction in various cost categories, such as congestion, vehicle operating, accident, air pollution, noise and maintenance costs.

After increasing the capacity of these road sections, using the same O-D demand matrices, traffic is reassigned onto the modified network, and the output information obtained from the traffic assignment is used for comparison of before-after costs. It should be noted that the impacts of each capacity investment are investigated separately, i.e. five different modified networks are created for five different capacity investments. To focus on multiple O-D pairs, TAZs in the vicinity of the improved road sections are selected, and the changes in trip-based costs are calculated using the developed GIS-based cost estimation tool NJCost, developed

and updated specifically for this study by the Rutgers Intelligent Transportation Systems (RITS) lab.

The analysis results show that the benefit cost ratio of the five selected projects range from 1.51 and 3.82. A demonstration of the methodology and selected results and the software developed for use by NJDOT will be presented as Exhibit A.

In addition to these activities, we met with Ms. Veronica Murphy and Mr. Steve Manera from NJDOT on February 25, 2009 to discuss the available data sources to identify the unit costs of highway transportation projects. Mr. Steve Manera suggested the use of "bidx" website that lists the awarded projects that dates back to 2005, and the NJDOT report "Average Weighted Price Report" that summarizes the unit cost of construction material, labor and other expenses for the current year. Ms. Camille Crichton-Sumners provided us with access to the bidx.com website and the aforementioned report. Based on our review of the website and the NJDOT average weighted price report, we decided that these sources would be of little use in understanding how various construction projects differ in price. Thus, we continued to use the detailed construction data we have been using thus far.

### **Task 3 – Estimate the direct and indirect impacts of transportation infrastructure expenditures on the economy (Bloustein Team: Dr. Joe Seneca, et al.)**

- We have continued to refine our classification of Capital Plan projects by type and size for aggregation in the final analysis and have also continued to refine our classification of past projects for creation of average cost functions by project type and size. Most of the project types to be used have now been identified. They are presented in Exhibit B, together with the construction production functions for each project type that will be used to generate the economic impact estimates that will be provided in the final report.
- We have run a sample analysis to demonstrate the differing impacts between similar projects in different regions of the state (see Exhibit C).

### **Task 4 – Estimate the effects of cost reduction due to transportation investments**

- We continue to examine how the outcomes of Task 2 (cost savings due to transportation investments) can be utilized in our macroeconomic econometric model of New Jersey to obtain estimates of the ongoing (i.e., annual) impacts in terms of such variables as productivity, output, income, employment and tax revenues.

### **Task 5 – Synthesize data results, identify policy implications and formulate recommendations**

- The team has developed a cost-benefit framework for use of the analyses carried out in the context of the project. In addition, Dr. Ozbay's team has begun an examination of the results of the capacity expansion analysis described above in order to develop an approach to generalizing the projected impacts of these projects based on location,

demand, traffic, and other factors. This approach, together with the analysis of construction impacts, will provide a framework for assessing the policy implications of transportation investments.

**Task 6 – Prepare quarterly progress reports, draft and final reports**

- Fourth quarterly report prepared and submitted with exhibits.

**Task 7 – Disseminate research results and conduct agency/legislative briefings**

- Not yet begun

**OTHER – General project administration activities**

- Undertook general project management activities, including project planning, internal coordination meetings and conference calls, budget and accounting.

**LIST OF EXHIBITS:**

- A. Demonstration of economic impact software and benefit-cost analysis methodology.
- B. Production functions for economic impact analysis of construction investments.
- C. Demonstration of differences in impacts of similar projects in North and South Jersey.
- D. Economic Impacts of NJDOT Construction-Phase Projects for Federal Stimulus

## Transportation Impact on the Economy

### BUDGET SYNOPSIS

Task No.	Task Description	Percent of TPC	Cost of Task	Current Billing		Previously Billed		Cumulative Expenses	
				Percent Complete	Cost	Percent Complete	Cost	Percent Complete	Cost
1	Literature review and current practice scan	4%	\$9,053	15%	\$1,358	85%	\$7,695	100%	\$9,053
2	Estimate aggregate impact on the economy	32%	\$66,252	35%	\$23,188	45%	\$29,814	80%	\$53,002
3	Estimate the direct and indirect impacts of transportation infrastructure expenditures on the economy	10%	\$20,736	20%	\$4,147	60%	\$12,441	80%	\$16,588
4	Estimate the effects of cost reduction due to transportation investments	19%	\$38,524	45%	\$17,336	30%	\$11,558	75%	\$28,894
5	Synthesize data results, identify policy implications and formulate recommendations	13%	\$26,153	50%	\$13,077	0%	-	50%	\$13,077
6	Prepare quarterly progress reports, draft and final reports	14%	\$29,092	15%	\$4,364	15%	\$4,365	30%	\$8,729
7	Disseminate research results and conduct agency/legislative briefings	9%	\$17,960	0%	-	0%	-	0%	-
	<b>TOTAL</b>	<b>100%</b>	<b>\$207,769</b>	<b>30.55%</b>	<b>\$63,470</b>	<b>31.70%</b>	<b>\$65,873</b>	<b>62.25%</b>	<b>\$129,343</b>
	<b>Additional / Extra Work</b>								

TPC = Total Project Cost

**NOTE:** The amounts reported above are estimates for reference purposes only and should not be used for official accounting purposes. For a more accurate accounting of project expenditures, please refer to the official invoice for this project issued by Rutgers University Division of Grant and Contract Accounting.

**NJDOT Concurrence:** \_\_\_\_\_  
Name Title Date

**Exhibit B**  
**Construction Production Functions for Transportation Improvements**

This exhibit provides the *production functions* that will be used to generate the impact estimates for each of the types of transportation projects listed below. A *production function* gives the percentage breakdown of material and labor inputs required for a project. For some projects, more than one production function is provided if there were significant differences in the composition of the function for projects of the same type, but the projects were of significantly different scale and magnitude. These production functions will be used to generate estimates of economic impact for each \$1 million of expenditures for each project type and magnitude. In addition, separate per-million-dollar impact estimates will be provided based on whether the project type/magnitude is implemented in North Jersey or South Jersey. Because we did not find significant differences in the composition of project production functions on a regional basis, the differences in impacts between regions will be limited to those differences resulting from the construction wage differentials between North and South Jersey.

Each of the production functions is divided into the material inputs and the service inputs, the latter of which include all construction labor associated with the project. The top panel of each production function for each project type indicates the number of past projects used to estimate the function and the range of project sizes (in millions of dollars) to which the function is applicable. There are eleven project types represented. They are listed here with the number of size classifications for which production functions were estimated:

<b>Project Type</b>	<b>No. of Size Classifications</b>
Bridge Rehabilitation/Repair	4
Bridge Replacement/Construction	2
Bridge Painting	1
Roadway Repair	1
Resurfacing	1
Resurfacing Maintenance Contracts	1
Intersection Improvements	2
Interchange Improvements	3
Drainage Restoration	2
Drainage Improvements	2
Road Widening and Construction	2

We are examining several other project types, but it is not clear whether we will be able to produce reliable production functions and impact estimates for them. They include: bridge deck replacement; pavement repair; bike/pedestrian paths; and ITS projects.

Technical Note: The cost breakdowns provided in the original NJDOT project bid sheets on which these cost functions are based did not explicitly disaggregate the labor and material components for the myriad subcontracted services involved in any given project. In order to estimate the division between the labor and material component of any given expenditure item, we used data provided in the Construction Industry Division of the 2002 Economic Census. This data provides the material and labor shares of net value added for a range of construction and construction-related activities, including highway, street and bridge construction; other heavy construction; electrical contracting; painting contractors; etc. The share of material in net value added ranged from approximately 27% for painting contractors to 42% for highway and street construction.

**Exhibit C**  
**Simulation: North Jersey vs. South Jersey Construction Impacts**

This simulation provides an example of the differential impacts between similar projects located in North and South Jersey. As a final product of this project, we will provide a set of look-up tables that will allow NJDOT to estimate the economic impacts of different types of projects in different regions of the state. This simulation is intended to demonstrate how and why those impacts differ based on the geography of a given project. It is provided in response to Brent Barnes' inquiry at our last quarterly meeting.

We conclude from this simulation, based on sizeable differentials in impacts, that there is a need to provide NJDOT with two separate tools by project type for NJDOT's use in estimating the economic impact of transportation investments – one for North Jersey projects and one for South Jersey Projects.

For this simulation, we have measured the economic impacts of a \$32 million road and bridge widening project from North Jersey, then measured the impacts of the same project, assuming it had been implemented in South Jersey. The project used for the simulation is DP03110 from NJDOT's database of awarded contracts. It covers the widening and associated improvements of sections of Rt. 80 and Rt. 95 in Bergen County.

We take two approaches to this simulation. In the first, we assume that the *same project, costing the same amount*, is built in South Jersey and in North Jersey. That is, we assume that approximately the same expenditures, including labor expenditures, are made for the project as would have been made in North Jersey. Because construction salaries are approximately 20-25% lower in South Jersey than in North Jersey, an allocation of the same total budget for the very same project in South Jersey will necessarily result in the hiring of additional workers, assuming that the project materials used are the same and that the costs of the materials are approximately the same in both regions.<sup>1</sup> If the projects

---

<sup>1</sup> For purposes of this simulation, construction workers average salaries in the South are set at \$62,570, while those of construction workers in the North are set at \$76,650 – a difference of approximately 22.5%.

in North and South Jersey are identical, this implicitly assumes that these workers are less productive than those in the North, and that this difference is reflected in their pay levels. While this is not a reasonable assumption, it is worth examining in order to demonstrate the differential impacts that result from similar spending in the two regions.

In the second, more realistic, approach, we assume that the construction workers in South Jersey are as productive as those in North Jersey. Thus, we lower the overall cost of the project to reflect the lower labor costs in South Jersey. This is the more realistic scenario when looking at similar projects in the two regions, but, it cannot, by definition reflect the comparative impacts of equal expenditure levels.<sup>2</sup>

The next three scenarios provide the simulation: Scenario 1 provides the impact analysis for the base case of the \$32 million road widening project in Bergen County. Scenario 2 estimates the impact of the same expenditure level for the same widening project in South Jersey, and Scenario 3 provides the impact for the same project at a lower total cost (\$28 million) due to lower labor costs in South Jersey.

---

<sup>2</sup> Note that there may also be differences in the materials used for similar projects in the North and South, which may affect the material costs of similar projects. In addition, even when the same materials are used, the indirect impacts of similar projects in the North and South may differ due to differences in the economic “leakage” resulting from purchases of materials from outside the state. While possible differences in material mix between the two regions are not reflected in the current simulation, they will be captured in the impact estimate tables provided in the final report to NJDOT of this contract. The differences in economic leakage resulting from the different supply options available in the two regions, however, are reflected in this simulation.

**Scenario 1**  
**Economic Impact on New Jersey of a \$32 Million Widening Project in North Jersey**

Table 1 presents the *direct* and *indirect* economic impacts of the project in North Jersey based on the cost breakdown provided in the NJDOT database.<sup>3</sup>

**Table 1**

<b>Indicator</b>	<b>Direct</b>	<b>Indirect</b>	<b>Total</b>	<b>Multiplier</b>
Employment (job-years)	191	88	279	1.42
GDP (\$ 000)	18,445	6,349	24,794	1.34
Income (\$ 000)	14,291	4,374	18,665	1.31
State Tax Revenue (\$000)			594	
Local Tax Revenue (\$000)			747	

Table 2 provides the industry breakdown of the employment generated by the project in New Jersey both directly – through construction, engineering and related jobs – and indirectly, through the multiplier effects of the expenditures on salaries and materials.

**Table 2**

<b>Sector</b>	<b>Employment (job-years)</b>
Natural Resources & Mining	6
Construction	147
Manufacturing	46
Transportation & Public Utilities	9
Wholesale Trade	10
Retail Trade	22
Financial Activities	12
Services	27
<b>Total</b>	<b>279</b>

Table 3 provides the *per-million dollar* spending impacts of the project.

**Table 3**

<b>Indicator</b>	<b>Impacts per \$1 million expenditure</b>
Employment (job-years)	8.8
GDP	\$780,269
Income	\$587,391
State Tax Revenues	\$18,703
Local Tax Revenues	\$23,500

<sup>3</sup> As we have discussed at previous meetings, the cost breakdowns provided in the NJDOT database are largely comprised of subcontracted items for which the labor and material components are not specified separately. Based on past experience and analysis of construction projects, as well as New Jersey-specific data from the Construction Series of the Economic Census, we have developed an algorithm for allocating labor and material shares in these cases. This algorithm will be further refined as we continue our analysis, and will be described in detail in the final report to NJDOT.

- Note that the direct employment generated exceeds that of the employment generated in the construction industry. This is due to the fact that some manufacturing and wholesale employment directly related to the project will be generated directly within New Jersey.
- Note also that the total GDP is less than the amount of the \$32 million in expenditures. This is due to the economic “leakage” of expenditures out of the state.

## Scenario 2

### Economic Impact on New Jersey of a \$32 Million Widening Project in South Jersey

Scenario 2, as previously described, assumes approximately the same division of labor and material costs for the project as in Scenario 1, with the difference that more direct construction employment is generated due to the lower average salaries in South Jersey, and the indirect impacts of the material expenditures are affected by the differences in “leakage” between the North and the South.

Table 1 presents the *direct* and *indirect* economic impacts of the project in South Jersey based on the cost breakdown provided in the NJDOT database.

**Table 1**

<b>Indicator</b>	<b>Direct</b>	<b>Indirect</b>	<b>Total</b>	<b>Multiplier</b>
Employment (job-years)	243	105	349	1.43
GDP (\$ 000)	18,667	5,978	24,645	1.32
Income (\$ 000)	14,433	4,144	18,577	1.29
State Tax Revenue (\$000)			530	
Local Tax Revenue (\$000)			674	

Table 2 provides the industry breakdown of the employment generated by the project in New Jersey both directly – through construction, engineering and related jobs – and indirectly, through the multiplier effects of the expenditures on salaries and materials.

**Table 2**

<b>Sector</b>	<b>Employment (job-years)</b>
Natural Resources & Mining	11
Construction	180
Manufacturing	66
Transportation & Public Utilities	11
Wholesale Trade	10
Retail Trade	23
Financial Activities	13
Services	35
<b>Total</b>	<b>349</b>

Table 3 provides the per-million dollar spending impacts of the project.

**Table 3**

<b>Indicator</b>	<b>Impacts per \$1 million expenditure</b>
Employment (job-years)	11.2
GDP	\$775,570
Income	\$584,620
State Tax Revenues	\$16,673
Local Tax Revenues	\$21,195

- Note that while the majority of indicators in Scenario 2 are of similar magnitude to those in Scenario 1, the direct and indirect employment levels are significantly higher.
- The higher level of direct employment results from the differential in the salaries paid to the construction workers working on the project.
- The higher level of indirect employment results primarily from the lower average salaries for the indirect jobs in South Jersey, as well as from differences in the amount of economic “leakage” from the state based on the materials needed for the project.
- These differentials in employment are also reflected in the per-million-dollar impacts in Table 3, indicating that a similar allocation of labor expenditures would produce 11.2 job-years per million dollars of expenditures in South Jersey, vs. 8.8 jobs per million dollars in North Jersey.

### Scenario 3

#### Economic Impact on New Jersey of a \$28 Million Widening Project in South Jersey

In Scenario 3, the total cost of the project has been reduced to \$28 million to reflect the differential in wages between North and South Jersey. This is in contrast to Scenario 2, in which the total cost of labor and material was maintained, but the lower average salaries for the direct employment generated higher levels of direct employment.

Table 1 presents the *direct* and *indirect* economic impacts of the project in South Jersey based on the cost breakdown provided in the NJDOT database.

**Table 1**

<b>Indicator</b>	<b>Direct</b>	<b>Indirect</b>	<b>Total</b>	<b>Multiplier</b>
Employment (job-years)	212	93	305	1.44
GDP (\$ 000)	16,049	5,302	21,387	1.33
Income (\$ 000)	12,479	3,672	16,151	1.29
State Tax Revenue (\$000)			468	
Local Tax Revenue (\$000)			597	

Table 2 provides the industry breakdown of the employment generated by the project in New Jersey both directly – through construction, engineering and related jobs – and indirectly, through the multiplier effects of the expenditures on salaries and materials.

**Table 2**

<b>Sector</b>	<b>Employment (job-years)</b>
Natural Resources & Mining	10
Construction	148
Manufacturing	65
Transportation & Public Utilities	10
Wholesale Trade	10
Retail Trade	20
Financial Activities	11
Services	31
<b>Total</b>	<b>305</b>

Table 3 provides the per-million dollar spending impacts of the project.

**Table 3**

<b>Indicator</b>	<b>Impacts per \$1 million expenditure</b>
Employment (job-years)	10.7
GDP	\$751,380
Income	\$567,435
State Tax Revenues	\$16,440
Local Tax Revenues	\$20,984

- Note that the amount of direct employment generated in the South still exceeds that generated in the North for the same project, though not by the same extent as in Scenario 2. This is likely the result of more project-related manufacturing, wholesale and/or engineering services being “available” in the South due to a lower level of economic “leakage” than in the Northern region.
- This difference, along with the lower average salaries for the indirect employment generated by the multiplier effect, results in a per-million-dollar employment impact of 10.7 job-years – higher than that of the North, but lower than that generated under the alternative scenario in which more direct jobs are created.

## **Conclusion**

This simulation demonstrates that sizeable differences occur in terms of the economic impact of transportation investments between projects in North vs. South Jersey.

Accordingly, we conclude that for accuracy in any future estimates made by NJDOT of the impact of construction spending on transportation, the methodology used should reflect these differential impacts. As a result, the final report of this contract to NJDOT will provide NJDOT with North and South impact multipliers for approximately 15 different project types.

**Exhibit D**  
**Economic Impacts of NJDOT Construction-Phase Projects for Federal Stimulus**

- 31 of the 33 construction phase projects from the NJDOT list of projects for funding support from the federal stimulus program are included in the analysis.
- These 31 projects account for \$1,271,016,000, or 96.5% of the estimated \$1,316,216,000 in construction investment required for all 33 projects.
- The projects have been divided into the following seven types:
  - Bridge Investments (general)<sup>§</sup>
  - Bridge Repair
  - New Bridges
  - Road Widening
  - Highway Operations
  - Road Improvements
  - Roadway Replacements
- These project types are based on a previous study done by the Bloustein School that generated preliminary estimates of economic impacts for broad categories of transportation infrastructure projects. As such, the impact estimates presented below in many cases are based on aggregate impacts for broad categories that include the types of projects represented in the NJDOT list, but do not necessarily reflect a more refined impact estimate for each specific project type. The NJDOT projects included in each of the categories are listed in Table 2, along with a brief description of each category's scope.
- The current study underway for NJDOT will provide much further detail and precision to estimate the impacts of transportation investment. It will also provide NJDOT with an accessible and easy to use set of general analytical tools to estimate the economic impact of any project or set of projects, such as this specific list of 33 potential projects for federal stimulus program support.
- The economic impacts for each type of project are given in Table 1. These comprise both the direct impacts of the construction process and the subsequent indirect impacts that result from the economic multiplier effects of the investment.

---

<sup>§</sup> This category is for projects that combine bridge replacement or new bridge construction with bridge repair projects.

**Table 1**  
**New Jersey Economic Impacts of NJDOT Construction Projects**

<b>Project Type</b>	<b>Investment Total (\$)</b>	<b>Employment (Job-years)</b>	<b>GDP (\$)</b>	<b>Income (\$)</b>	<b>State Tax Revenues (\$)</b>	<b>Local Tax Revenues (\$)</b>
Bridge Investments (general)	30,000,000	270	22,202,580	15,861,360	722,520	817,050
Bridge Repair	260,500,000	1,563	165,555,044	91,581,120	4,961,223	5,820,091
New Bridges	502,116,000	5,523	391,163,427	298,167,025	13,020,872	14,574,419
Road Widening	101,000,000	909	71,120,867	54,968,038	2,465,006	2,788,812
Highway Operations	30,600,000	275	21,922,483	15,836,602	730,208	829,382
Road Improvements	339,300,000	2,036	215,634,650	119,283,969	6,461,969	7,580,641
Roadway Replacements	7,500,000	68	5,262,278	3,974,273	181,500	205,763
<b>Total</b>	<b>1,271,016,000</b>	<b>10,644</b>	<b>892,861,329</b>	<b>599,672,386</b>	<b>28,543,297</b>	<b>32,616,158</b>

- In total, the **combined direct and indirect economic impacts on New Jersey** of the potential \$1.27 billion in transportation infrastructure expenditures in the analysis include:
  - 10,644 job-years;
  - \$892 million in new GDP for the state;
  - \$599.7 million in income (an average of \$56,339 per job-year);
  - \$28.5 million in state tax revenues; and
  - \$32.6 million in local tax revenues.
- Note that the estimated impact for GDP is less than the total initial investment amount. This is due to economic “leakage” of some of the expenditures outside of the state, as some material and labor will be drawn from outside the state.
- Also, these impacts are only the immediate economic benefits resulting from the expenditure of funds. Longer term benefits, such as commuting time saved, business cost reductions, traffic accidents avoided, are not included and will be both substantial and sustained over many years. The current study will also provide to NJDOT the methodologies to estimate such longer term benefits.

**Table 2**  
**Projects Included in the Analysis (by project category)**

<b>DB#</b>	<b>Project Name</b>
<b><u>Bridge Investments (general)</u></b>	
03304	Bridge Deck Replacement Program
<b><u>Bridge Repair</u></b>	
00372	Route 295, Gloucester/Camden Rehabilitation, Route 45 to Berlin-Haddonfield Road
X08	Bridge Painting Program
06371	Route 46, Hackensack River Bridge
99417	Route 3, Hackensack River (eastbound and westbound) Rehabilitation
06370	Route 30, Absecon Boulevard over Beach Thorofare (DB# 06370)
04386	Route 17, Northbound over I-80, Bridge Deck Replacement
06369	Route 37, Mathis Bridge Eastbound over Barnegat Bay
00357	Route 72, Manahawkin Bay Bridges
<b><u>New Bridges</u></b>	
93281	Route 46, Main Street, Lodi
244A	Route 52, Causeway Replacement and Somers Point Circle Elimination, Contract B
98516	Tuckahoe Road NJT Bridge, Cape May Branch Rail Line, CR 557, MP 14.64
051	Route 1&9T, St. Paul's Avenue/Conrail Bridge (25)
9189	Route 22, Park Avenue/Bonnie Burn Road
<b><u>Road Widening</u></b>	
94068	Route 73, Fox Meadow Road/Fellowship Road
779	Route 206 Bypass, Belle Mead-Griggstown Road to Old Somerville Road (14A 15A)
<b><u>Highway Operations</u></b>	
9111B	Route 46, Hollywood Avenue
06391	Barrier Gate Replacement
285A	Route 80, Truck Weigh Station, Eastbound, Knowlton Township
<b><u>Road Improvements</u></b>	
2149H	Route 49/55, Interchange Improvements at Route 55
089	Route 10, Route 53 Interchange ( 2L 3J)
98545	Route 78, Garden State Parkway, Interchange 142
08324	Route 295, Rancocas-Mount Holly Road to Route 130, Pavement Repair & Resurfacing
9377	Route 30, Cooper River Drainage Improvements
07307	Route 287, Vicinity of Stelton Road to Vicinity of Main Street, Resurfacing
00373B	Route 78, Union/Essex Rehabilitation, Contract B
07311	Route 80, Westbound, East of South Beverwyck Road to West of the Route 23 Interchange, Resurfacing
X35A1	Rail-Highway Grade Crossing Program, Federal
99327A	Resurfacing, Federal
07310	Route 80, Eastbound, West of Madison Avenue to Polify Road, Resurfacing
<b><u>Roadway Replacements</u></b>	
03316	Median Crossover Crash Prevention Program, Contract No. 9

## **Project Category Descriptions**

### **Bridge Investments (general)**

This broad category covers both the construction of new bridges and the repair of existing structures and the impact estimates represent an average of the two types of impacts. The Bridge Deck Replacement Program was included here because the project description calls for both preservation and replacement of existing decks and superstructures.

### **Bridge Repair**

This category includes bridge deck rehabilitation, as well as various repair activities for both large and small concrete and steel bridges.

### **New Bridges**

This category includes construction of new bridges and replacement and in some cases widening of existing bridges.

### **Road Widening**

This category covers additions of lanes and shoulders to highways and streets and is also applied here to the construction of a new road for the Rt. 206 Bypass under DB# 779.

### **Highway Operations**

This category includes a variety of maintenance and repair functions aimed at alleviating congestion on the state's roads.

### **Road Improvements**

This category includes a wide variety of improvements, including resurfacing projects, construction of new interchanges and improvements to existing interchanges, and drainage and other improvements.

### **Roadway Replacements**

This category includes such components as median barrier replacements, emergency sign warning replacements and toll plaza rehabilitation.